

What is Claimed:

1 1. A circuit for applying a transfer function to an input signal comprising:
2 an input line for receiving the input signal;
3 a plurality of operators for generating piecewise-linear segments of the
4 transfer function; and

5 a window detector for determining a value of the input signal and selecting one
6 of the operators based on the value of the input signal;

7 wherein the selected one of the operators applies a correction value to correct
8 the value of the input signal.

1 2. The circuit of claim 1 wherein the selected operator generates the
2 piecewise-linear segment free of a table for defining the piecewise-linear segments of the
3 transfer function.

1 3. The circuit of claim 1 wherein each of the operators generates a
2 different one of the piecewise-linear segments of the transfer function.

1 4. The circuit of claim 3 wherein each of the operators simultaneously
2 generates a respective correction value responsive to the value of the input signal; and

3 the circuit further including a multiplexer for selecting one of the respective
4 correction values to correct the value of the input signal.

1 5. The circuit of claim 4 wherein the window detector includes a plurality
2 of digital comparators and an encoder for selecting the one respective correction value to
3 correct the value of the input signal.

1 6. The circuit of claim 1 wherein the selected operator includes a
2 multiplier for multiplying the value of the input signal with a value of a slope of the
3 piecewise-linear segment generated by the selected operator.

1 7. The circuit of claim 1 wherein the selected operator includes a
2 subtractor, a multiplier and an adder;

3 the subtractor subtracting a lower value of the piecewise-linear segment,
4 generated by the selected operator, from the value of the input signal to provide an offset
5 value;

6 the multiplier multiplying the offset value with a value of a slope of the
7 piecewise-linear segment to provide a product; and

8 the adder adding the product and a low output value of the piecewise-linear
9 segment to provide the correction value.

1 8. The circuit of claim 1 wherein the input signal is a video signal and the
2 transfer function is an inverse gamma transfer function.

1 9. A gamma correction circuit for applying an inverse gamma transfer
2 function to an input video signal, the circuit comprising:

3 an input line for receiving the input video signal;

4 a plurality of operators for generating piecewise-linear segments of the inverse
5 gamma transfer function; and

6 a window detector for determining a value of the input video signal and
7 selecting one of the operators based on the value of the input video signal;

8 wherein the selected one of the operators applies a correction value to correct
9 the value of the input video signal.

1 10. The circuit of claim 9 wherein the selected operator generates the
2 piecewise-linear segment free of a table for defining the piecewise-linear segments of the
3 inverse gamma transfer function.

1 11. The circuit of claim 9 wherein each of the operators generates a
2 respectively different one of the piecewise-linear segments of the inverse gamma transfer
3 function.

1 12. The circuit of claim 11 wherein each of the operators simultaneously
2 generates a respective correction value responsive to the value of the input signal; and

3 the circuit further including a multiplexer for selecting one of the respective
4 correction values to correct the value of the input video signal.

1 13. The circuit of claim 12 wherein the window detector includes a
2 plurality of digital comparators and an encoder for selecting the one respective correction
3 value to correct the value of the input video signal.

1 14. The circuit of claim 9 wherein the operator includes a multiplier for
2 multiplying the value of the input video signal with a value of a slope of the piecewise-linear
3 segment generated by the selected operator.

1 15. The circuit of claim 9 wherein the operator includes a subtractor, a
2 multiplier and an adder;

3 the subtractor subtracting a lower value of the piecewise-linear segment,
4 generated by the selected operator, from the value of the input video signal to provide an
5 offset value;

6 the multiplier multiplying the offset value with a value of a slope of the
7 piecewise-linear segment to provide a product; and

8 the adder adding the product and a low output value of the piecewise-linear
9 segment to provide the correction value.